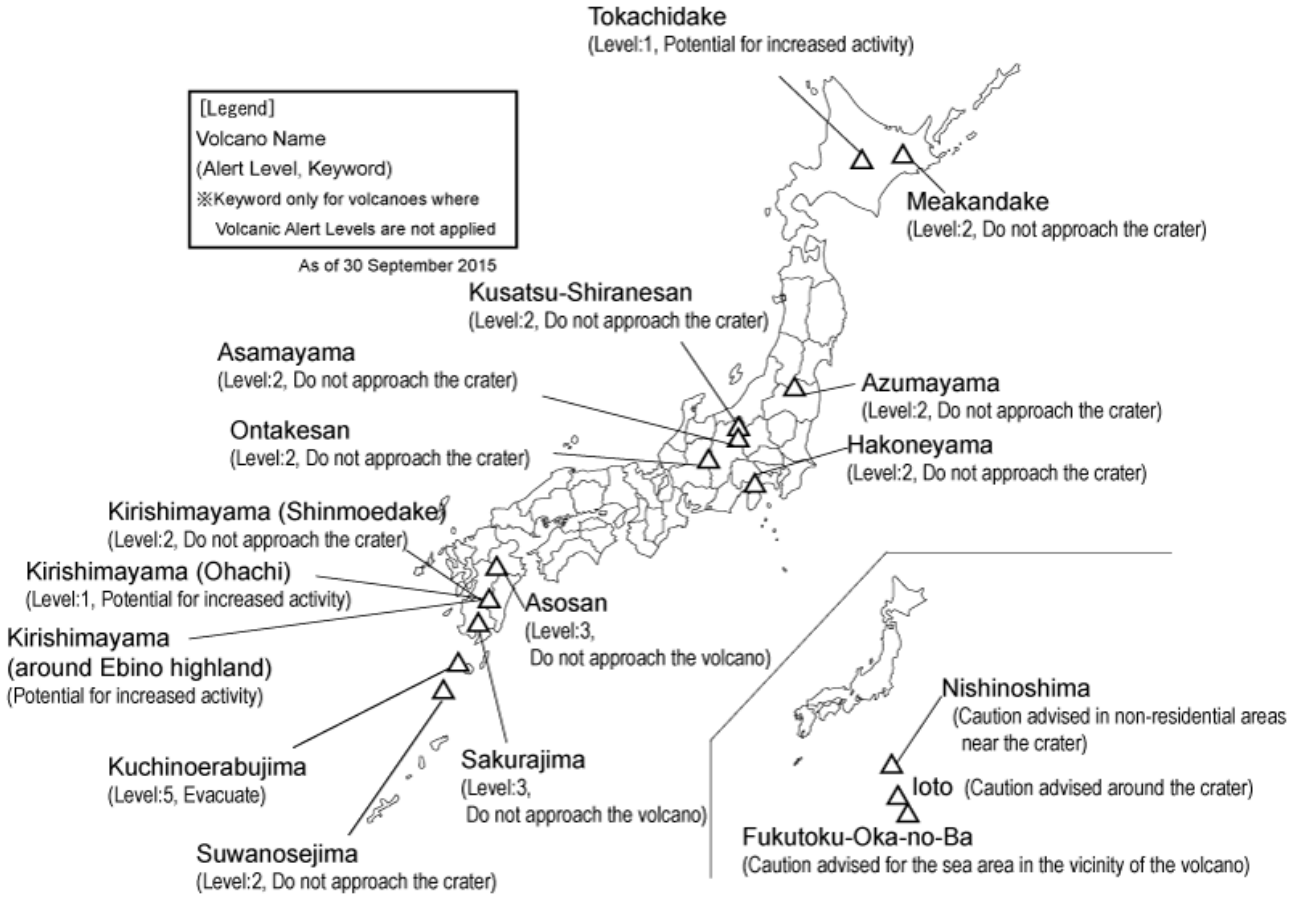
Monthly Volcanic Activity Report (September 2015)

Japan Meteorological Agency



Meakandake (Alert Level: 2)

A field survey and aerial observation conducted in collaboration with the Japan Coast Guard (JCG) on 1 October revealed a slight expansion of the geothermal field on the north wall of the Ponmachineshiri 4th crater compared with the extent observed during a field survey conducted in July, and a temperature rise at the bottom of the Ponmachineshiri 96-1 crater compared to the value observed during a field survey the previous October. Further violent plume emissions and strong foul odors were also recorded at the 96-1 crater, reflecting the possibility of increased volcanic gas emissions.

Data from continuous observation of geomagnetic total intensity showed an almost-static state from March 2014 to mid-March 2015, since when a decreasing trend has been seen. This indicates an ongoing trend of increased thermal activity under the area around the Ponmachineshiri 96-1 crater since mid-March 2015.

The number of very small volcanic earthquakes in shallow parts under the area around the Ponmachineshiri crater began to decrease in August, but volcanic seismicity remained relatively high as compared to the period before mid-April 2015.

Tokachidake (Alert Level: 1)

According to field surveys conducted on 6, 7, 16 and 17 September, a geothermal field was seen at the Furikosawa fumaroles as previously observed during field surveys from June to August. This geothermal field was viewed in aerial observation conducted on 17 September in collaboration with the Hokkaido Regional Development Bureau of the Ministry of Land, Infrastructure, Transport and Tourism (MLIT/HRDB). The results revealed (as per previous observation) fumes with foul odors from the Furikosawa fumaroles, a slight crack with emissions of geothermal heat between the southern edge of the 62-2 crater and the fumaroles, and fumes from a

line of fumaroles around the Maetokachi summit. The upwelling of hot water previously seen at the bottom of the 62-2 crater had stopped.

Thermal activity in and around the 62-2 crater remained high.

Continuous and repeated GNSS* observation has revealed ongoing changes indicating the inflation of shallow parts immediately under the 62-2 crater since 2006. Changes indicating local deformation around Maetokachi Station near the crater have been observed since around May 2015, but the trend has declined since July. A baseline connecting Bougakudai, Okina Onsen and Yunotaki has exhibited slight expansion since around May. This indicates the possibility of slight inflation in areas deeper than those immediately under the 62-2 crater, which have shown inflation since 2006. This expanding trend has declined since August

* GNSS (Global Navigation Satellite System) is a generic name for satellite positioning systems such as GPS.

Azumayama (Alert Level: 2)

Fumarolic activity at the Oana crater has remained at relatively high levels.

Volcanic seismicity immediately under the Oana crater temporarily increased, with 26 seismic events recorded on 13 September and a total of 96 in September (44 in August). No volcanic tremors have been recorded.

According to data from a tiltmeter at Joudodaira station, ground deformation with a slow rising trend had been seen on the western side (toward the crater) since April 2014 but stopped around July 2015. Continuous GNSS observation data had shown a slow change since around September 2014 indicating the inflation around Issaikyouzan, but it stopped around June 2015. Data from wide-area ground deformation observation by the Geospatial Information Authority of Japan (GSI) revealed a trend indicating that the volcano had been inflating along some parts of the baseline since around December 2014, but the trend stopped around July 2015.

Kusatsu-Shiranesan (Alert Level: 2)

Volcanic seismicity beneath Yugama (a crater lake) and its southern area has increased since early March 2014. It has remained at relatively low levels since 20 August of the same year but temporary increases have occasionally been seen in January and February 2015. Data from ground deformation observation had shown a trend of inflation around Yugama since around April 2014, but this has declined since around April 2015.

Thermal activity remains ongoing on the northeastern side and the northern wall of the Yugama crater and on the north-to-northeastern slope of the Mizugama crater. According to the Tokyo Institute of Technology, composition of gas in a fumarolic area to the north and chemical composition of water in the Yugama crater have also shown the changes indicating increased volcanic activity. Geomagnetic total intensity variations, considered indicative of a temperature rise beneath Yugama, were seen in observation data from May 2014 onward but stopped around July 2014.

Asamayama (Alert Level: 2)

No eruption has been recorded since the eruption on 19 June 2015.

Imperceptible volcanic seismicity in very shallow parts immediately under the summit has remained at high levels. Many of the earthquakes were low-frequency BL types. The number of short-period BH-type volcanic earthquakes increased in July but has decreased since August. No migration of source locations to shallower parts or other changes have been seen. The number of volcanic tremors showed a slight increasing trend from 19 August but has remained low since September.

Weak volcanic glows visible only at night with a high-sensitivity camera continued at the summit crater and the volume of plume emissions has shown an increasing trend since June.

According to field surveys conducted on 2 and 30 September, amounts of SO_2 emissions have continuously been large at 600 – 1,900 tons a day (1,500 tons on 3 August).

According to continuous GNSS observation data, ground deformation indicating contraction of the volcano had been seen since autumn in 2009 but a slight extension has been observed along some parts of the baseline since around May 2015. Data from tiltmeter observation show that there has been a gradual change since around early June, indicating inflation in slightly deeper parts under the western side of the summit. This ongoing trend has slowed since late July. Data from electro-optical distance measurement show that there has been a trend of contraction between the summit and Oiwake since around June, reflecting the possibility of inflation in very

shallow parts under the summit.

Ontakesan (Alert Level: 2)

Volcanic seismicity has remained at low levels, but has not yet returned to the levels observed before August 2014. No low-frequency earthquakes and volcanic tremors have been recorded.

The potential for eruptions on the scale of the one that occurred on 27 September 2014 is considered low, as volcanic activity has remained at low levels and no eruptions have occurred since October 2014. However, despite low levels of plume activity and seismic activity, the potential for a sudden eruption smaller than the one that occurred on 27 September 2014 cannot be eliminated.

Hakoneyama (Alert Level: 2) ← Alert level downgrade from 3 to 2 on 11 September

No eruptions have been recorded since a minor one considered to have occurred at Owakudani between 30 June and 1 July.

Volcanic seismicity has declined and remained at low levels since July. No low-frequency earthquakes and volcanic tremors have been recorded.

No changes indicating volcanic activity have been seen in JMA/Hot Springs Research Institute of Kanagawa Prefecture tiltmeter data or JMA volumetric strainmeter observation at Yugawara-Kajiya since August. Data from continuous GNSS measurement conducted by the GSI show that there has been ground deformation indicating inflation of the volcano along baselines around Hakoneyama since April 2015, but the trend indicating the inflation of the volcano stopped around late August.

Therefore, JMA issued a Near-crater Warning at 14:00 on 11 September and lowered the Volcanic Alert Level from 3 (Do not approach the volcano) to 2 (Do not approach the crater).

Data from field surveys conducted on 3 and 29 September indicate the ejection of material considered to be dark-gray soil in the 15-1 crater as the previous field survey on 28 August. The scale of this eruption was small with ejection heights lower than the crater rim, and no ejecta was scattered outside the rim during observation. Violent emissions of fumes and steam were observed as before at the 15-1 crater and all fumaroles. No scattering of lapilli pieces or traces thereof were observed. No remarkable changes have been seen in the overall situation at Owakudani (including amounts of fumes and steam) compared with the results of the previous field survey.

Despite low levels of seismic activity, very small eruptions may occur in the area around Owakudani, which is expected to become a crater after a future eruption, because volcanic activity has not yet returned to the levels observed before late April and fumarolic activity around Owakudani has remained high.

Nishinoshima (Near-crater Warning)

Reports from JCG and other institutions show that accumulation of lapilli pieces due to eruptions and lava flow have continued. Aerial observations were conducted on 16 and 20 September by JCG. Continuous emission of blueish-white-to-white volcanic gas was observed in the 7th crater and a fumarole on the eastern slope of a pyroclastic cone. Light-brown discolored water was seen along the coast of the island.

Aerial observation conducted on 16 September revealed lava from the northeastern side of a pyroclastic cone flowing westward, northwestward, and southeastward. The newly formed land measured around 1,940 m in the east-west direction and 1,950 m in the north-south direction, creating an area of around 2.671 km^2. No remarkable changes were seen in the area of land coverage, in contrast to the situation of the previous observation (1,970 m east-west, 1,970 m north-south and 2.71 km^2 as of 19 August 2015). No faults parallel to the coastline or cracks with the potential to generate tsunamis were seen on the island or on newly formed land.

Eruptions are estimated to continue at the crater on the newly formed land, and submarine eruptions may also occur around the island. A submarine eruption affecting the sea surface may scatter ballistic projectiles or generate a base surge spreading across the surface at a high speed. Related impacts may reach areas as far as around 2 km away.

Ioto (Near-crater Warning)

Volcanic seismicity has remained at relatively low levels but temporary increased after a large-amplitude volcanic earthquake occurred on 14 September. A total of 8 volcanic tremors occurred. No anomalies were observed in other data during the period in which volcanic tremors were recorded.

Continuous GNSS measurement showed a rising trend from around early December 2014 and the speed of the trend started to increase in around March 2015. Data from GNSS measurement conducted by GSI showed that the rate of deformation to the west increased from mid-April, but since July it has returned to the rate observed before March 2015.

Fukutoku-Oka-no-Ba (Near-sea-area Warning)

According to aerial observations conducted by JCG, the Japan Maritime Self Defense Force (JMSDF) and JMA so far, discoloration and floating objects have frequently been identified in the water surrounding Fukutoku-Oka-no-Ba in recent years. These are considered to stem from volcanic activity. The latest submarine eruption occurred on 3 February 2010.

Asosan (Alert Level: 3) ← Alert level upgrade from 2 to 3 on 14 September

A small eruption occurred at 09:43 on 14 September at the Nakadake No.1 crater and gray plumes rose as high as 2,000 m above the crater rim and drifted to the northwest. A minor pyroclastic flow generated by an eruption flowed in the area around the crater. Ballistic projectiles reached the area around the crater.

JMA issued a Near-crater Warning at 10:10 on the same day and raised the Volcanic Alert Level from 2 (Do not approach the crater) to 3 (Do not approach the volcano) in consideration of the potential for eruptions on a similar scale with ballistic projectiles reaching areas over 1 km from the crater.

Aerial observation conducted on 14 September by the JMA Mobile Observation Team (JMA-MOT) in collaboration with the Kyushu Regional Bureau of the Ministry of Land, Infrastructure, Transport and Tourism revealed discoloration around the Nakadake No. 1 crater extending around 1.3 km southeast and around 1.0 km northeast. The discolored area was considered to generally correspond to the area reached by a pyroclastic flow.

Field surveys and inquiry surveys conducted on 14 September revealed volcanic ash fall in certain areas to the west of the crater stretching from northern Kumamoto Prefecture to Fukuoka Prefecture.

Continuous eruptions have occurred since 14 September, and volcanic activity has remained at high levels.

Kirishimayama (Shinmoedake) (Alert Level: 2)

Volcanic earthquakes occasionally occurred immediately under the Shinmoedake crater.

According to GNSS observation data, a slight extension has been observed along some baselines around Shinmoedake. In addition, ground deformation indicating deeper magma chamber inflation at several kilometers northwest of Shinmoedake has shown an extension since December 2013 but stopped around January 2015.

Kirishimayama (Ohachi) (Alert Level: 1)

The number of volcanic earthquakes temporarily increased, with 20 seismic events recorded on 15 September and a total of 50 in September (29 in August). This was the largest number of volcanic earthquakes observed in a day since 2 May 2010, when 21 were recorded. These occurred mainly in shallow parts around Ohachi. No volcanic tremors were recorded.

A field survey conducted on 18 September showed no remarkable changes in fumes from the crater. Thermal infrared observation revealed a smaller area of thermal anomaly near the bottom of the crater compared with the area observed in November 2010.

No remarkable changes were seen in volcanic activity and no signs of eruption were observed, but volcanic seismicity has been at relatively high levels since around July.

Kirishimayama (around Ebino highland) (Potential for increased activity)

A small-amplitude volcanic tremor occurred at 01:02 on 2 September that lasted around 3 minutes. Data from a tiltemeter at Karakunidake NE Station showed an associated slight rising trend on the northwestern side of Ioyama. Volcanic seismicity has slightly increased with 28 seismic events recorded (15 seismic events in August). Volcanic earthquakes occurred 1 to 3 km below sea level in an area stretching from the northwestern to the northeastern side of Karakunidake.

Field surveys conducted on 2, 29 and 30 September no fumes at or around Ioyama. Thermal infrared observation showed no remarkable changes in ground surface temperature distribution.

According to continuous GNSS observation data, a slight extension has been observed along some baselines

around Ebino highland.

No remarkable changes were seen in volcanic activity and no signs of eruption were observed.

Sakurajima (Alert Level: 3) ← Alert level downgrade from 4 to 3 on 1 September

On 15 August, volcanic earthquakes occurring immediately under Minamidake were recorded frequently and data from tiltmeter and strainmeter observation on the island showed rapid ground deformation indicating the expansion of the volcano. Accordingly, JMA raised the Volcanic Alert Level from 3 (Do not approach the volcano) to 4 (Prepare to evacuate).

The rise of magma intruding under Minamidake to shallower parts has stopped and no new magma has intruded from deeper parts thereafter, JMA issued a Near-crater Warning at 16:00 on 1 September and lowered the Volcanic Alert Level to 3 (Do not approach the volcano).

Volcanic activity has remained at high levels with 46 explosive eruptions recorded at the Showa crater (5 explosive eruptions in August).

Volcanic glows visible clearly at night with a high-sensitivity camera were observed occasionally at the crater.

Eruptions were observed at the Minamidake summit crater on 13 and 28 September. It was the first time to observe an eruption at the Minamidake summit crater since 7 November 2014. At the eruption at 02:33 on 28 September, plumes rose as high as 2,700 m above the crater rim.

Data from tiltmeter observation conducted on the island and data from continuous GNSS observation show no remarkable changes since the rapid ground deformation observed on 15 August indicating the expansion of the volcano. A long-term extension of the baseline across the Aira Caldera (in the inner part of Kagoshima Bay) remains ongoing.

Kuchinoerabujima (Alert Level: 5)

Volcanic activity has remained at high levels.

No eruption has been observed at the Shindake crater after the very small eruption on 19 June.

Volcanic seismicity remained at relatively high levels until early September but gradually declined thereafter. No volcanic tremors were recorded.

Observation conducted by the University of Tokyo’s Graduate School of Science, Kyoto University’s Disaster Prevention Research Institute, Yakushima Town and JMA show that amounts of SO_2 emissions remained relatively low at 100 – 200 tons a day (200 – 300 tons a day in August) except on 10 September, when the amount was relatively large at 700 tons a day.

The potential for eruptions on a scale similar to that of 29 May remains.

Suwanosejima (Alert Level: 2)

Volcanic activity has remained at high levels with 89 explosive eruptions recorded at the Otake crater.

69 explosive eruptions were observed on 24 September. It was the first time to observe more than 50 explosive eruptions a day since 30 December 2013. Plumes accompanying the eruption rose as high as 1,500 m above the crater rim (1,200 m in August).

Volcanic glows were observed at the crater at night with a high-sensitivity camera.

According to the Suwanosejima branch of the Toshima Village administration, ash fall was observed in the village (located around 4 km SSW of Otake) on 7 September. Shaking of window panes and internal doors was reported in association with explosive eruptions that began on 24 September. Explosions and rumbling were heard on the island.